

Application Number 10/601,131

Amendment in response to Office Action mailed March 6, 2008

AMENDMENTS TO THE CLAIMS

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This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

Claim 1 (Currently Amended) A method comprising:

receiving a request via a network layer device for activation or modification of a network multimedia service account of ~~from~~ a subscriber device;

in response to receiving the request, querying a server with the network layer device for information relating to a service profile that is associated with the subscriber; and

dynamically configuring a control object stored by a data link layer device with the network layer device in accordance with the service profile to control the data link layer device to provide data link layer functionality facilitate packet transmission for the subscriber between the data link layer device and the network layer device in accordance with the request service profile.

Claim 2 (Currently Amended) The method of claim 1, further comprising:

~~wherein receiving a request for a multimedia service comprises~~ receiving a multicasting protocol message from ~~the~~ a subscriber device, device associated with the subscriber; and

~~dynamically configuring a control object comprises~~ dynamically configuring multicast filter information stored by the data link layer device to control the data link layer device to perform multicast elaboration in accordance with the multicasting protocol message.

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Claim 3 (Currently Amended) The method of claim 2, wherein the multicasting protocol message identifies a multicast stream, the method further comprising:

associating the multicast stream with one of a virtual circuit, virtual local area network, ~~and~~ or an address; and

encapsulating and forwarding packets for the multicast stream to the data link layer device in accordance with the association,

wherein dynamically configuring a multicast filtering table comprises dynamically configuring the multicast filtering table to associate the one of a virtual circuit, virtual local area network, ~~and an~~ or address that is associated with the multicast stream with one of a virtual circuit ~~and or~~ an address that is associated with the subscriber device.

Claim 4 (Original) The method of claim 2, the method further comprising:

receiving a plurality of multicast protocol messages;

replicating a multicast stream for the data link layer device to produce a copy of the multicast stream; and

forwarding the copy of the multicast stream to the data link layer device,

wherein dynamically configuring a multicast filtering table comprises dynamically configuring the multicast filtering table to cause the data link layer device to replicate the copy of the multicast stream for each of a plurality of subscriber devices in accordance with the multicast protocol messages.

Claim 5 (Currently Amended) The method of claim 2, wherein the multicast protocol message requests a multicast stream, the method further comprising:

maintaining information that identifies multicast streams as one of premium ~~and~~ or non-premium; and

determining whether the requested multicast stream is a premium ~~multicast stream~~,

wherein dynamically configuring a multicast filtering table comprises dynamically configuring the multicast filtering table stored by the data link layer device based on the determination.

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Claim 6 (Currently Amended) The method of claim 5, further comprising:

replicating the requested multicast stream at the network layer device on a per data link layer device basis when the requested multicast stream is a premium ~~multicast stream~~; and

replicating the requested multicast stream on at the network layer device on a per subscriber basis when the requested multicast stream is a non-premium ~~multicast stream~~.

Claim 7 (Currently Amended) ~~The method of claim 1, wherein receiving a request for a multimedia service comprises~~ A method comprising:

receiving a request via a network layer device for transmission of packets according to a quality of service class ~~for a unicast packet flow from the~~ a subscriber device, device; and

~~wherein dynamically configuring a control object comprises~~ dynamically configuring a quality of service profile stored by a data link layer device for a layer-2 link between the data link layer device and the subscriber device ~~that is stored by the data link layer device with the network device to control the data link layer device to~~, ~~and wherein the data link layer device forwards packets for the subscriber device via the layer-2 link according to the quality of service profile to facilitate packet transmission according to the requested quality of service class.~~

Claim 8 (Currently Amended) The method of claim 7, wherein the ~~unicast packet flow request for transmission of packets~~ comprises a packet flow request for a voice over Internet Protocol call that specifies the subscriber device.

Claim 9 (Currently Amended) The method of claim 7, wherein dynamically configuring a quality of service profile comprises controlling the data link layer device to provide preferential queuing of the packets of the packet flow based on the requested quality of service class.

Claim 10 (Canceled).

Claim 11 (Currently Amended) The method of claim 1 ~~[[0]]~~, wherein receiving a request for activation of an account comprises receiving a message indicating physical connection of a customer premises equipment device to a network.

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Claim 12 (Original) The method of claim 1, wherein dynamically configuring a control object stored by a data link layer device comprises sending a control message from the network layer device to the data link layer device.

Claim 13 (Currently Amended) The method of claim 12, wherein sending a control message comprises sending the control message via ~~one of a virtual circuit and a virtual local area network~~ that ~~are~~ is reserved for transmission of the control message.

Claim 14 (Original) The method of claim 12, wherein sending a control message comprises sending an in-band Internet Protocol message.

Claim 15 (Currently Amended) The method of claim 1, wherein the data link layer device comprises one of a switch, an access multiplexer, ~~and~~ or a customer premises equipment device.

Claim 16 (Currently Amended) The method of claim 1, wherein the network layer device is comprises a service edge router.

Claim 17 (Original) The method of claim 16, wherein the service edge router comprises a broadband remote access server.

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Claim 18 (Currently Amended) A network layer device comprising a control unit that receives a request for activation of a network multimedia service account of from a subscriber device, queries a server for information relating to a service profile that is associated with the subscriber in response to receiving the request, and dynamically configures a control object stored by a data link layer device in accordance with the service profile to control the data link layer device to provide facilitate packet transmission for the subscriber between the data link layer device and the network layer device functionality in accordance with the request service profile.

Claim 19 (Currently Amended) The network layer device of claim 18, wherein the control unit receives a multicasting protocol message from the a subscriber device associated with the subscriber, and dynamically configures multicast filter information stored by the data link layer device to control the data link layer device to perform multicast elaboration in accordance with the multicast protocol message.

Claim 20 (Currently Amended) The network layer device of claim 19, wherein the multicasting protocol message identifies a multicast stream, and the control unit associates the multicast stream with one of a virtual circuit, a virtual local area network, and or an address, forwards packets for the multicast stream to the data link layer device in accordance with the association, and dynamically configures the multicast filtering table filter information to associate the one of a virtual circuit, virtual local area network, and an or address that is associated with the multicast stream with one of a virtual circuit, and or an address that is associated with the subscriber device.

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Claim 21 (Original) The network layer device of claim 19, wherein the control unit receives a plurality of multicast protocol messages, replicates a multicast stream to produce a copy of the multicast stream, forwards the copy of the multicast stream to the data link layer device, and dynamically configures the multicast filter information to cause the data link layer device to replicate the copy for each of a plurality of subscriber devices in accordance with the multicast protocol messages.

Claim 22 (Currently Amended) The network layer device of claim 19, wherein the multicast protocol message requests a multicast stream, and the control unit maintains information that identifies multicast streams as one of premium and non-premium, determines whether the requested multicast stream is a premium ~~stream~~, and dynamically configures the multicast filter information stored by the data link layer device based on the determination.

Claim 23 (Currently Amended) The network layer device of claim 22, wherein the control unit replicates the requested multicast stream on a per data link layer device basis when the requested multicast stream is a premium ~~multicast stream~~, and replicates the requested multicast stream on a per subscriber basis when the requested multicast stream is a non-premium ~~multicast stream~~.

Claim 24 (Currently Amended) ~~The network layer device of claim 18, wherein the~~ A network layer device comprising a control unit that receives a request for transmission of packets according to a quality of service class for a ~~unicast packet flow~~ from a subscriber device associated with the subscriber, and dynamically configures a quality of service profile stored by a data link layer device for a layer-2 link between the data link layer device and the subscriber device ~~that is stored by the data link layer device~~ to control the data link layer device to facilitate packet transmission for the subscriber device via the layer-2 link according to the requested quality of service class.

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Claim 25 (Currently Amended) The network layer device of claim 24, wherein the ~~unicast~~ packet flow request comprises a packet flow request for a voice over Internet Protocol call that includes the subscriber device.

Claim 26 (Currently Amended) The network layer device of claim 24, wherein the control unit dynamically configures the quality of service profile to control the data link layer device to provide preferential queuing of the packets of the packet flow based on the requested quality of service class.

Claim 27 (Canceled).

Claim 28 (Currently Amended) The network layer device of claim ~~27~~ 18, wherein the control unit detects activation of the account by receiving a message indicating physical connection of a customer premises equipment device to a network.

Claim 29 (Original) The network layer device of claim 18, wherein the control unit sends a control message to the data link layer device to dynamically configure the control object stored by the data link layer device.

Claim 30 (Currently Amended) The network layer device of claim 29, wherein the control unit sends the control message via ~~one of a virtual circuit and~~ a virtual local area network that ~~are~~ is reserved for transmission of the control message.

Claim 31 (Original) The network layer device of claim 18, wherein the data link layer device comprises one of a switch, an access multiplexer, and a customer premises equipment device, and the network layer device comprises a provider service edge router.

Claim 32 (Currently Amended) The network layer device of claim ~~16~~ 18, wherein the network layer device comprises a broadband remote access server.

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Claim 33 (Currently Amended) A computer-readable storage medium comprising instructions that cause a programmable processor to:

receive a request for activation of modification of a network multimedia service account of ~~from~~ a subscriber device;

in response to receiving the request, query a server for information relating to a service profile that is associated with the subscriber; and

dynamically configure a control object stored by a data link layer device in accordance with the service profile to control the data link layer device to provide data link layer functionality facilitate packet transmission for the subscriber between the data link layer device and the network layer device in accordance with the request service profile.

Claim 34 (Currently Amended) The computer-readable storage medium of claim 33, further comprising instructions that cause a programmable processor to:

~~wherein the instructions that cause a programmable processor to receive a request for network layer functionality comprise instructions that cause a programmable processor to receive a~~ multicasting protocol message from the a subscriber device associated with the subscriber, and

~~wherein the instructions that cause a programmable processor to dynamically configure a control object comprise instructions that cause a programmable processor~~ dynamically configure multicast filter information stored by the data link layer device to control the data link layer device to perform multicast elaboration in accordance with the multicast protocol message.

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Claim 35 (Currently Amended) The computer-readable storage medium of claim 34, wherein the multicasting protocol message identifies a multicast stream, the medium further comprising instructions that cause a programmable processor to:

associate the multicast stream with one of a virtual circuit, virtual local area network, ~~and~~ or an address; and

forward packets for the multicast stream to the data link layer device, the packets encapsulated according to the associated one of the virtual circuit, virtual local area network, and address,

wherein the instructions that cause a programmable processor to dynamically configure a multicast filtering table comprise instructions that cause a programmable processor to associate the one of a virtual circuit, virtual local area network, ~~and an~~ or address that is associated with the multicast stream with one of a virtual circuit ~~and~~ or an address that is associated with the subscriber device.

Claim 36 (Currently Amended) The computer-readable storage medium of claim 34, wherein the multicasting protocol message identifies a multicast stream, the medium further comprising instructions that cause a programmable processor to:

maintain information that identifies multicast streams as one of premium and non-premium; and

determine whether the requested multicast stream is a premium ~~multicast stream~~,

wherein the instructions that cause a programmable processor to dynamically configure a multicast filtering table comprise instructions that cause a programmable processor to dynamically configure the multicast filtering table based on the determination.

Claim 37 (Currently Amended) The computer-readable storage medium of claim 36, further comprising instructions that cause a programmable processor to:

replicate the requested multicast stream at the network layer device on a per data link layer device basis when the requested multicast stream is a premium ~~multicast stream~~; and

replicate the requested multicast stream at the network layer device on a per subscriber basis when the requested multicast stream is a non-premium ~~multicast stream~~.

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Claim 38 (Currently Amended) ~~The computer-readable medium of claim 33, wherein the A~~
computer-readable storage medium comprising instructions that cause a programmable processor
to:

~~receive a request for a multimedia service comprise instructions that cause a~~
programmable processor to receive a request for transmission of packets according to a quality of
service class ~~for a unicast packet flow from a subscriber device; associated with the subscriber,~~
and

~~wherein the instructions that cause a programmable processor to dynamically configure a~~
~~control object comprise instructions that cause a programmable processor to dynamically~~
configure a quality of service profile stored by a data link layer device for a layer-2 link between
the data link layer device and the subscriber device ~~that is stored by the data link layer device to~~
control the data link layer device to facilitate packet transmission for the subscriber device via
the layer-2 link according to the requested quality of service class.

Claim 39 (Currently Amended) The computer-readable storage medium of claim 38,
wherein the ~~unicast packet flow request~~ comprises a ~~packet flow request~~ for a voice over Internet
Protocol call that includes the subscriber device.

Claim 40 (Currently Amended) The computer-readable storage medium of claim 38,
wherein the instructions that cause a programmable processor to dynamically configure a quality
of service profile comprise instructions that cause a programmable processor to control the data
link layer device to provide preferential queuing of packets ~~of the packet flow~~ based on the
requested quality of service class.

Claim 41 (Canceled).

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Claim 42 (Currently Amended) The computer-readable storage medium of claim 40 33, wherein the instructions that cause a programmable processor to detect activation of an account comprise instructions that cause a programmable processor to receive a message indicating physical connection of a customer premises equipment device to a network.

Claim 43 (Currently Amended) The computer-readable storage medium of claim 33, wherein the instructions that cause a programmable processor to dynamically configure a control object stored by a data link layer device comprises instructions that cause a programmable processor to send a control message from a network layer device to the data link layer device.

Claim 44 (Currently Amended) A method comprising:
receiving a request via a data link layer device for activation or modification of a network service account of a subscriber;
forwarding the request from the data link layer device to a network layer device;
storing a control object within the data link layer device;
receiving a control message from a the network layer device by the data link layer device,
the control message sent by the network layer device to the data link layer device in response to a
the request and including information relating to a service profile for the subscriber for a
multimedia service sent from a subscriber device to the network layer device;
dynamically configuring the control object based on the control message; and
providing data link layer functionality transmitting packets from the data link layer device
to the network layer device for the subscriber in accordance with the requested multimedia
service profile based on the configuration of the control object.

Claims 45 and 46 (Canceled).

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Claim 47 (Currently Amended) ~~The method of claim 44, wherein the control message includes quality of service information, the~~ A method comprising:

storing a control object that comprises a quality of service profile for a layer-2 link between the a data link layer device and the a subscriber device within the data link layer device;
receiving a request for transmission of packets according to a quality of service class from the subscriber device at the data link layer device;

forward the request from the data link layer device to a network layer device;

receiving a control message that comprises quality of service information from the network layer device at the data link layer device, the control message sent by the network layer device in response to the request;

~~dynamically configuring the control object comprises~~ dynamically configuring the quality of service profile based on the quality of service ~~information;~~ information; and

~~providing data link layer functionality comprises~~ transmitting the packets for the subscriber device via the layer-2 link according to the quality of service information.

Claim 48 (Currently Amended) The method of claim 47, wherein the request ~~for a multimedia service~~ comprises a request for a quality of service class for a unicast packet flow, and transmitting the packets for the subscriber device comprises transmitting packets for the unicast packet flow according to the requested quality of service class.

Claim 49 (Original) The method of claim 48, wherein the unicast packet flow comprises a packet flow for a voice over Internet Protocol call that includes the subscriber device.

Claim 50 (Currently Amended) The method of claim 47, wherein transmitting the packets comprises providing preferential queuing of the packets ~~of the packet flow~~ based on the quality of service information.

Claim 51 (Currently Amended) The method of claim 44, wherein the network layer device ~~is~~ comprises a service edge router, and the data link layer device comprises one of a switch, an access multiplexer, ~~and or~~ or a customer premises equipment device.

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Claim 52 (Currently Amended) The method of claim 42 44, wherein network layer device comprises a broadband remote access server.

Claim 53 (Currently Amended) A data link layer device, comprising a control unit to:
receive a request for activation or modification of a network service account of a
subscriber;

forward the request to a network layer device;

store a control object;

receive a control message from a network layer device, the control message sent by the network layer device in response to a the request for a multimedia service sent from a subscriber device to the network layer device, and including information relating to a service profile for the subscriber;

dynamically configure the control object based on the control ~~message,~~ message; and ~~provide data link layer functionality~~ transmit packets to the network layer device in accordance with the ~~requested multimedia service~~ profile based on the configuration of the control object.

Claims 54 and 55 (Canceled).

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Claim 56 (Currently Amended) ~~The data link layer device of claim 53, wherein the~~ A data link layer device, comprising a control unit to:

receive a request for transmission of packets according to a quality of service class from a subscriber device;

forward the request to a network layer device;

store a control message includes quality of service information, the control object that comprises a quality of service profile for a layer-2 link between the data link layer device and the subscriber device, and device;

receive a control message from the network layer device, the control message sent by the network layer device in response to the request and including quality of service information;

~~wherein the control unit dynamically configures the quality of service profile based on the quality of service information;~~ information; and

~~provides data link layer functionality by transmitting the packets for the subscriber device via the layer-2 link according to the quality of service information.~~

Claim 57 (Currently Amended) The data link layer device of claim 56, wherein the request ~~for a multimedia service~~ comprises a request for a quality of service class for a unicast packet flow, and the control unit transmits packets for the unicast packet flow according to the requested quality of service class.

Claim 58 (Original) The data link layer device of claim 57, wherein the unicast packet flow comprises a packet flow for a voice over Internet Protocol call that includes the subscriber device.

Claim 59 (Currently Amended) The data link layer device of claim 56, wherein the control unit provides preferential queuing of the packets of the packet flow based on the quality of service information.

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Claim 60 (Currently Amended) The data link layer device of claim 53, wherein the network layer device ~~is~~ comprises a service edge router, and the data link layer device comprises one of a switch, an access multiplexer, ~~and or~~ a customer premises equipment device.

Claim 61 (Original) The data link layer device of claim 53, wherein the network layer device comprises a broadband remote access server.

Claim 62 (Currently Amended) A computer-readable storage medium comprising instructions that cause a programmable processor to:

receive a request for activation or modification of a network service account of a subscriber via a data link layer device;

forward the request from the data link layer device to a network device;

store a control object;

receive a control message from a the network layer device, the control message sent by the network layer device in response to a the request ~~for a multimedia service sent from a subscriber device to the network layer device~~ and including information relating to a service profile for the subscriber;

dynamically configure the control object based on the control message; and

~~provide data link layer functionality~~ transmit packets from the data link layer device to the network layer device for the subscriber in accordance with the requested multimedia service profile based on the configuration of the control object.

Claims 63 and 64 (Canceled).

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Claim 65 (Currently Amended) The A computer-readable storage medium ~~of claim 62,~~

comprising instructions that cause a programmable processor to:

~~wherein the control message includes quality of service information and the~~ store a control object
that comprises a quality of service profile for a layer-2 link between the a data link layer device
and the a device; device;

receive a request for transmission of packets according to a quality of service class from a
subscriber device at the data link layer device;

forward the request from the data link layer device to a network layer device;

receive a control message that comprises quality of service information from the network
layer device, the control message sent by the network layer device in response to the request;

~~wherein the instructions that cause a programmable processor to dynamically configure~~
~~the control object comprises instructions that cause a programmable processor to dynamically~~
~~configure the control object~~ quality of service profile based on the quality of service ~~information,~~
information; and

~~wherein the instructions that cause a programmable processor to provide data link layer~~
~~functionality comprise instructions that cause a programmable processor to transmit packets for~~
the subscriber device via the layer-2 link according to the quality of service information.

Claim 66 (Currently Amended) The computer-readable medium of claim 65, wherein the
request for a ~~multimedia service~~ comprises a request for a quality of service class for a unicast
packet flow, and the instructions that cause a programmable processor to transmit the packets for
the subscriber device comprise instructions that cause a programmable processor to transmit
packets for the unicast packet flow according to the requested quality of service class.

Claims 67-92 (Canceled).

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Claim 93 (New): The method of claim 11,

wherein dynamically configuring the control object stored by the data link layer device with the network layer device comprises sending a control message from the network layer device to the data link layer device via a layer-2 control channel,

the method further comprising receiving at least one of a synchronization rate, a media access control address, or queuing profile information for the customer premises equipment from the data link layer device via the layer-2 control channel.

Claim 94 (New): The method of claim 44, wherein receiving a control message from the network layer device comprises receiving the control message via a layer-2 control channel, and receiving a request for activation or modification of a network service account of a subscriber comprises detecting coupling of a customer premises equipment to network by the data link layer device, the method further comprising:

receiving at least one of a synchronization rate, a media access control address, or queuing profile information for the customer premises equipment at the data link layer device; and

forwarding the at least one of the synchronization rate, media access control address, or queuing profile information from the data link layer device to the network layer device via the layer-2 control channel.

Claim 95 (New): The method of claim 1, wherein dynamically configuring the control object stored by the data link layer device with the network layer device comprises sending a control message from the network layer device to the data link layer device via at least one of an Ethernet or tunneling protocol control channel.

Claim 96 (New): The method of claim 44, wherein receiving a control message from the network layer device comprises receiving the control message via at least one of an Ethernet or tunneling protocol control channel.

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Claim 97 (New): A method comprising:

receiving a request via a network layer device for a multimedia service from a subscriber device; and

sending a control message from the network layer device to a data link layer device via at least one of an Ethernet or tunneling protocol control channel to configuring a control object stored by a data link layer device with the network layer device to control the data link layer device to provide data link layer functionality in accordance with the request.

Claim 98 (New) The method of claim 97, wherein sending a control message comprises sending the control message via a virtual local area network that is reserved for transmission of the control message.